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CONTENTS

PAGE

ARROW, Gilbert J., F.Z.S., F.R.E.S. A new giant species of Ruteline Coleoptera . . . . . 49–50, 1 fig.

BEY-BIENKO, G., D.Sc. A new species of the genus *Gratidia* Stål (Phasmoidea) from Iran, with a list of Palaearctic species of the genus . . 74–76, 2 figs.

COCKERELL, Professor T. D. A., F.R.E.S. African Nomiine bees (Hymenoptera) 63–67

DONISTHORPE, Horace, F.Z.S., F.R.E.S. A new subspecies of *Messor* Forel, and a new variety of *Aphaenogaster* Mayr (Hym. FORMICIDAE) from Turkey 53–54

DONISTHORPE, Horace, F.Z.S., F.R.E.S. Undescribed forms of *Camponotus* (*Colobopsis*) *vitiensis* from the Fiji Islands (Hymenoptera, FORMICIDAE) 69–70

HARRIS, W. Victor, F.R.E.S. Termites from British Somaliland (Isoptera) . . . . . 67–68, 1 fig.

JORDAN, H. E. Karl, Ph.D., F.R.S., F.R.E.S. A new flea from Turkey (Siphonaptera) . . . . . 51–53, 2 figs.

LEWIS, D. J., F.R.E.S., and KIRK, R. Five new species of *Phlebotomus* (Diptera, PSYCHODIDAE) from the Sudan . . . . . 55–60, 5 figs.

LEWIS, D. J., F.R.E.S., and KIRK, R. The male of *Phlebotomus serratus* Parrot & Malbrant (PSYCHODIDAE, Diptera) . . . . . 61–62, 1 fig.

WARREN, B. C. S., F.R.E.S., PASSOS, Cyril F. dos, and GREY, Lionel P. Supplementary notes on the classification of ARGYNNINAE (Lepidoptera, NYMPHALIDAE) 71–73

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A NEW GIANT SPECIES OF RUTELINE COLEOPTERA

By Gilbert J. Arrow, F.Z.S., F.R.E.S.

British Museum (Nat. Hist.).

Amongst the numerous species, amounting to several thousands, in the Lamellicorn subfamily Rutelinae those of two genera, only distantly related, reach gigantic size, viz., *Heterosternus* and *Spodochlamys* and, as is the case with the giants of so many different groups of animals, both display a remarkable dissimilarity between the two sexes, at least in those species which attain the largest size and in full-sized examples of their species. In the genus *Spodochlamys* only one species among those at present described (the largest, *S. mirabilis* C. O. Waterhouse) shows a high degree of dimorphism, the males and females of others of comparatively small size being only distinguishable by a close examination. Another, now described, of equal size to *S. mirabilis* is dimorphic to an equally remarkable extent, for it can be safely assumed that the unknown female closely resembles that of *S. mirabilis*.

Fig. 1.—Males of *Spodochlamys latipes* sp. n. (left) and *S. mirabilis* (right). Actual size.

Spodochlamys latipes sp. n.

Deep grass-green above and dark metallic green or red beneath, the legs deep yellow, with a metallic suffusion, the pygidium greenish-yellow, closely clothed with decumbent white hairs, and with a terminal tuft of long yellow hairs, the punctures of the upper surface containing very minute and inconspicuous white setae. Head and pronotum strongly and closely punctured, elytra shining, less closely and more finely punctured.

♂. Clypeus broad, gently rounded in front, pronotum elevated in the middle, the sides dilated in the posterior half, inclined upwards and produced to a blunt angle, the anterior half strongly contracted, gently sinuate externally and produced to a sharp angle, elytra slightly rugose at the base and sides, narrower at base than the pronotum, the shoulders simply rounded. Middle and hind tibiae short and broad, front tibia elongate, strongly curved and very narrow in its posterior half and broad and flat in its anterior half, the tibial spur large and clavate, front femur armed with a very strong sharp spine, gently curved but not hooked at the tip, longer claw of the front and middle feet entire, that of the hind foot cleft.

Length 45 mm.; breadth 22 mm.

E. Ecuador: Mangosisa R., alt. 650 m. (*L. Gomez*).

The close relationship of *S. latipes* to *S. mirabilis* is unmistakable. The males of these two species alone seem to possess the stout spine upon the front femur, and only these and *S. curvibrachialis* Ohaus, the grotesquely elongated front tibiae. The last-mentioned species differs also in the metallic reflections of the head, thorax and scutellum. It is a native of Colombia and the other two inhabit Ecuador. The differences between *S. mirabilis* and *latipes* are slight but numerous. The new form is more brightly coloured, the upper surface having the rich green colour of *S. weberi* Ohaus and more shining, particularly upon the elytra, the surface closely but less densely punctured and the minute setae borne by the punctures less numerous in consequence. The clypeus is not produced in front but gently rounded, the pronotum is more narrowed in front, with more produced front angles, and more dilated behind, its greatest convexity being in the middle and not behind it. The shoulders of the elytra are simply rounded and not spined. The spine upon the front femur is longer than that of *S. mirabilis* and not hooked at the tip. The front tibia differs little from that of the allied form but is strongly curved and not bent in its basal half and a little broader in the fore-part. The tibial spur is stout and club-shaped, as in *S. mirabilis*, but less broad. The middle and hind tibiae are shorter, broader and flatter and the two transverse ridges at the outer edge less distinct.

A NEW FLEA FROM TURKEY (SIPHONAPTERA)

By H. E. Karl Jordan, Ph.D., F.R.S., F.R.E.S.

The British Council has forwarded to the British Museum (Natural History) some fleas received from the Director of the Higher Institute of Agriculture at Ankara with a request for the identification of the specimens, which were obtained on *Spalax*. The fleas usually infesting *Spalax* are species of *Ctenophthalmus*, these Turkish specimens being no exception. As was to be expected,

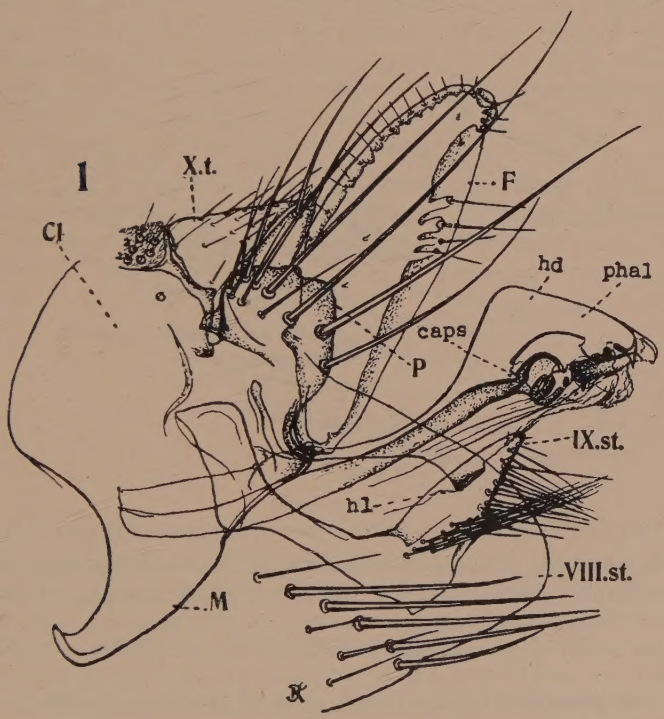

Fig. 1.—*Ctenophthalmus turcicus*, male, terminal segments.

they represent a species considerably different from those recorded up to the outbreak of war. Whether a *Spalax*-flea has been described since is not known to me, as the literature on fleas which may have been published on the Continent during the war has not reached England. It is, however, unlikely that a foreign collector has been active in Turkey since 1939, and one may therefore assume that the species from Ankara is still undescribed. The host is probably a subspecies of *Spalax monticola*.

Ctenophthalmus turcicus sp. n. (figs. 1 and 2).

The species is distinguished from its nearest relatives by the comparatively large number of bristles on the pleura of the meso- and metathorax and on the abdominal sterna VI and VII, especially in the female, by the reduction in the number of the occipital bristles and the pronotal spines, and by the structure of the terminal segments of the abdomen.

Frons in male with 5 or 6 bristles in the anterior row and in female with 2 or 3 somewhat smaller ones. On occiput there are on each side anteriorly 2 bristles, medianly 1 and posteriorly a row of 5 or 6 in male and 4 or 5 in female, the bristle second from below being absent in the female or replaced by a minute hair. The comb of the pronotum contains 14 spines. The mesopleurum bears 8 to 10 bristles, of which 5 to 7 usually form an anterior row (more or less regular and subvertical in male and more irregular and oblique in female), and 3 or 4 placed on the posterior area. Episternum of metathorax with 4 or 5 bristles, rarely with 3; near upper posterior corner of metasternum 1 bristle, more rarely 2; on metepimerum two rows, the first containing 4 to 6 bristles and the posterior one 5 to 7, the uppermost bristle

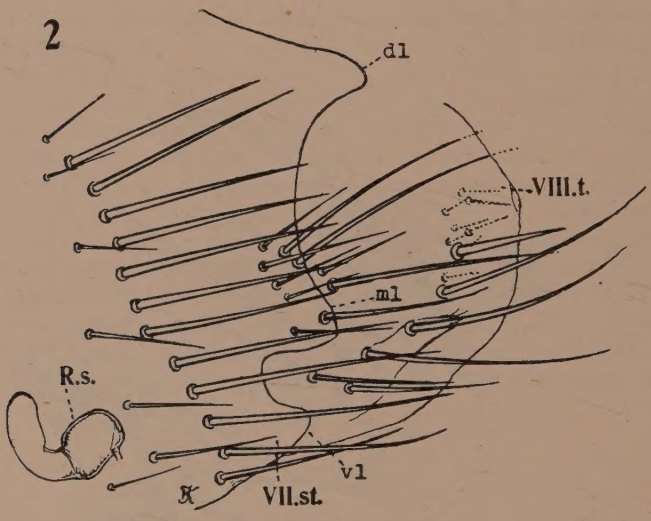

Fig. 2.—*Ctenophthalmus turcicus*, female, segments VII and VIII.

of the posterior row being placed close to the stigma. On abdominal tergum I (the two sides together) 3 apical spines, on II sometimes one, usually none, on III and following none. The bristles on the abdominal sterna are much more numerous in the female than in the male, the main row being usually preceded by smaller bristles, as follows (the two sides together): ♂: on III 1 to 3, 8 to 10, IV 2 or 3, 8 to 10, V 0 to 2, 8 to 10, VI 0 or 1, 8 or 9, VII 1 or 2, 8 to 11; ♀: on III 8 or 9, 16 or 17, IV 4, 15 to 19, V 2 to 7, 18 or 19, VI 3 to 6, 19 to 24, VII 9 to 14, 27 to 31.

Legs similar to those of *Ct. spalacis* J. & R. 1911 and several other species.

Terminal segments.—Male (fig. 1): Apical margin of sternum VIII strongly rounded ventrally; the outline of the segment appearing much less regular in alcohol specimens than in mounted (and therefore compressed) ones; distantly from apex an oblique posterior row of 12 to 15 long stout bristles (on the two sides together) and in front of the row 7 or 8 much smaller ones. The apical process (P) of the clasper (Cl) broad and obtuse, not divided by a conspicuous sinus into two lobes, the sinus being at most slightly indicated, as it is in fig. 1; the process bears 6 large bristles and a few smaller ones, one or two ventral

large bristles being marginal, the other long ones lateral. Digitoid (F) about one-fourth longer than the distance from its base to the tip of the manubrium (M) of the clasper; its gently curved upper margin, which bears a row of about 15 short stiff pale bristles of the type usually found along this margin, is five-eighths the length of the ventral margin and the greatest width of F half the length of the dorsal margin; in the upper half of the ventral margin there is a group of 4 (sometimes 3) slender bristles, of which the longest is about two-thirds as long as the digitoid is broad. Sternum IX very distinctive, being elongate-triangular, ventrally slightly angulate beyond middle and bearing from this hump to the apex a row of about 10 long bristles, besides a few short ones at apex; the row anteriorly continued upward-forward by an irregular double row of long bristles which cross the ventral ones, a conspicuous feature of this species. The hood (hd) of the phallosome (phal) strongly convex above the capsule (caps); the heel (hl) of the mantle sclerotised, the heel appearing in lateral aspect as a conspicuous linear sclerite; the colouring of the mantle from the heel to the hood uniform, there being no pale area above the heel.

Female (fig. 2): Sternum VII bisinuate (each side), the upper sinus being broad and shallow and the lower one narrow and deeper; the dorsal lobe (dl) is the longest, narrowing gradually, with the tip rounded off; the median lobe (ml) is much shorter and much broader and the ventral one (vl) is much the smallest; there is a row of 27 to 31 bristles (on the two sides together) and in front of the row 9 to 14 smaller bristles. Tergum VIII bears (each side) 6 to 8 bristles above the spiracle, a lateral group of 7 to 10 and a ventral row of 5 to 10, there being on the inner surface 8 small ones. Body of spermatheca (R.s.) a little longer than broad, its tail nearly twice as long as the body.

Length ♂ 2·4 mm., ♀ 2·8 mm.; hind femur ♂ 0·39 mm., ♀ 0·45 mm.

TURKEY: district of Ankara, on *Spalax*, 1 June 1944, 7 ♂, 3 ♀; type (♂) and a ♂ and a ♀ retained in the collection of the British Museum (Natural History), the other 7 paratypes returned to Ankara.

A NEW SUBSPECIES OF *MESSOR* FOREL, AND A NEW VARIETY OF *APHAENOGASTER* MAYR (HYM. FORMICIDAE) FROM TURKEY

By Horace DONISTHORPE, F.Z.S., F.R.E.S.

Messor barbarus L. subsp. **mediosanguineus** subsp. n.

♀ & ☿. Head and gaster shining black, mandibles and thorax blood red, petiole and postpetiole blackish, apex of former reddish, legs and antennae brown.

Head with larger and smaller scattered punctures; hairs beneath head sparse and uneven, some fairly long. *Thorax* transversely striate. *Epinotum* armed with two short pointed teeth.

Long. 4–6·5 mm.

Described from 21 specimens. TURKEY (*Kosswig*).
Type in British Museum (Natural History).

Aphaenogaster testaceopilosa Lucas subsp. **semipolita** Nylander var. **rufotestacea** var. n.

☿. Reddish ferrugineous, gaster somewhat darker; eyes black. Size, outstanding hairs, spines of epinotum, etc., as in *semipolita*. First segment of gaster finely longitudinally striate at base.

Described from 5 ☿. TURKEY (*Kosswig*).
Type in British Museum (Natural History).

The original description of *semipolita* Nyl., is as follows :—

" In Sicilia vero capta est a cel. Zeller species valde affinis et similis huic varietati, sed paullulum minor et abdomine toto nitido, laevissimo. Dicatur *M. semipolita*."

" On reconait aisément le *M. testaceo-pilosa* à son scape finement strié, et à son premier segment abdominal d'un velouté mat."

It is curious, but nowhere is the colour of *semipolita* mentioned! One might conclude that it was black, as Nylander speaks of *testaceopilosa* Lucas as " nigra vel piceo-nigra "; Lucas describes *testaceopilosa* as " noire." Er. André writes : " Corps noir ou d'un brun noir "; Emery : " Farbe schwarz "; and Santschi : " noir."

I captured many specimens of *semipolita* in various localities in Sicily, the identification being confirmed by Menozzi. They are all of a dark reddish-brown.

Emery takes rather a wide view of *semipolita*, for he states :—" Dorsalplatte des Basalsegments der Gaster wenigstens an den Seiten glatt und stark glänzend; seltener ist die ganz Dorsalplatte glatt und nur an der Basis gestrichelt."

In the original description the gaster is described as "toto nitido, laevissimo."

I found the ants described above among a large number of species sent to me to determine from the University of Istanbul, through the agency of my friend Dr. Malcolm Burr. Most of them, I believe, were taken by Professor Kosswig.

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FIVE NEW SPECIES OF *PHLEBOTOMUS* (DIPTERA, PSYCHODIDAE) FROM THE SUDAN

By D. J. Lewis, F.R.E.S., and R. Kirk

(*From the Stack Medical Research Laboratories, Khartoum.*)

Phlebotomus (Phlebotomus) lesleyae sp. n.

♀. *Length*: 1·9 mm. *Antenna*: formula 2/III–VIII (distal segments missing), segment III = 0·15 mm., < IV + V, shorter than epipharynx (A III/E = 0·8); geniculate spines short and blunt, that on IV about 0·2 length of segment. *Palp*: relative lengths of I–III 1, 2·7, 3·0 (IV + V missing). *Epipharynx*: length 0·20 mm. *Buccal cavity*: unarmed

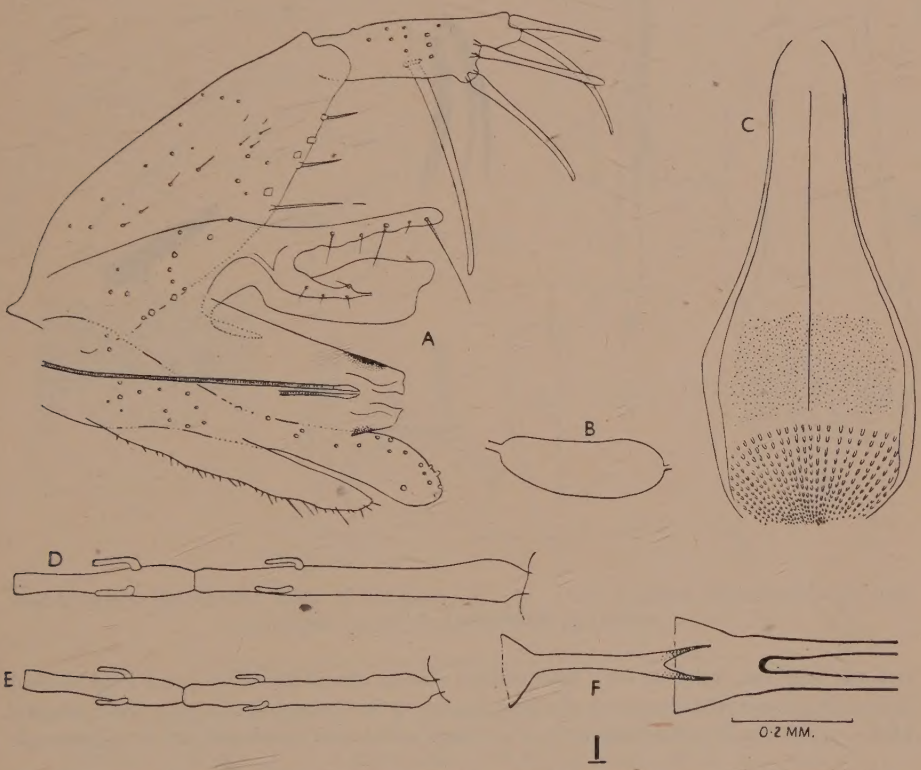

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Fig. 1.—*Phlebotomus lesleyae* sp. n.: a, ♂ terminalia; b, spermatheca; c, pharynx of ♀; d, third and fourth antennal segments of ♀; e, same segments of ♂; f, pompetta.

but with minute ridges, without pigmented area. *Pharynx*: twice as wide posteriorly as anteriorly, pigmented in middle, armed with strongly developed blunt teeth pointed inwards and backwards. *Wing*: length 1·48 mm., breadth 0·29 mm., index (alpha over beta) 0·3, delta −0·06 mm. *Abdomen*: erect hairs present on I–VII. *Spermatheca*: a thin-walled sac without annulations.

♂. *Length*: 1·7 mm., hind leg 1·92 mm. *Antenna*: formula 2/III–XI (distal segments missing), segment III = 0·12 mm., < IV + V, longer than epipharynx (A III/E = 1·5); geniculate spines short and blunt, that on IV = 0·2 length of segment. *Palp*: formula 1, 2, 4, 3, 5, relative lengths 1, 1·8, 6·0, 4·0, 9·0. *Epipharynx*: length 0·08 mm. *Buccal cavity*: unarmed and without pigmented area. *Pharynx*: hardly wider posteriorly than anteriorly, unarmed except for faint ridges. *Wing*: length 1·14 mm., breadth 0·18 mm., index 0·1, delta —0·11. *Abdomen*: with erect hairs on I to VII; pompetta large, lying in segment III; genital filament thick, with annulated appearance in posterior half. *Terminalia*: superior clasper I = 0·21 mm. (twice as long as II), II = 0·10 mm., intermediate clasper 0·19 mm., inferior clasper 0·20 mm., intromittent organ 0·11 mm.; distal segment of superior clasper bearing five spines, one terminal, one slightly sub-terminal, two at 0·7

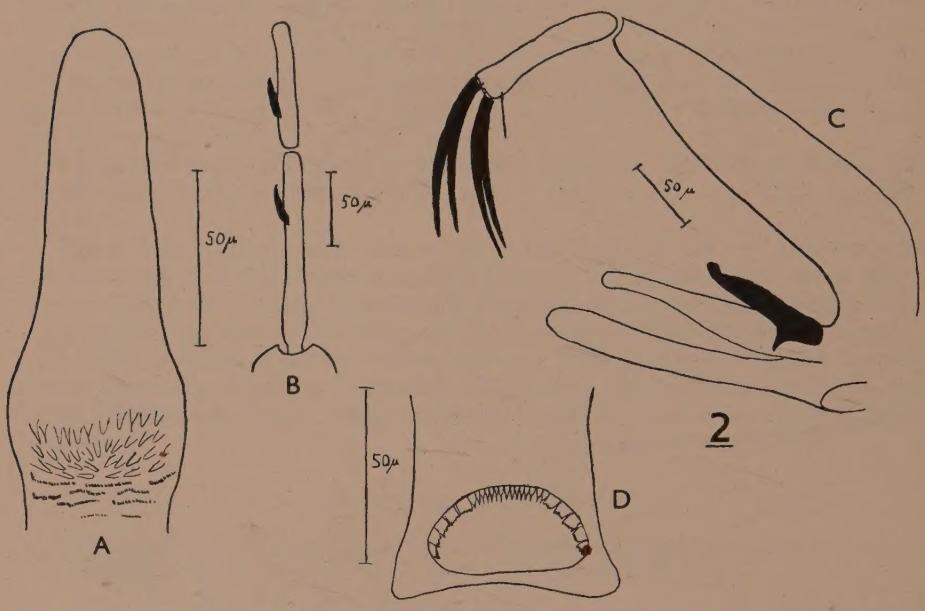

Fig. 2.—*Phlebotomus cowlandi* sp. n., ♂: a, pharynx; b, third and fourth antennal segments; c, terminalia; d, buccal cavity.

and one very long spine at 0·3; intermediate clasper consisting of an upper lobe bearing hairs and a lower lobe composed of a stem bearing a few hairs and of a thin broad smooth plate; intromittent organ thick and conical and with broad distal end, lightly pigmented.

Anglo-Egyptian Sudan: Nuba Mountains area, Kortala, 31.i.41 (*D. J. Lewis*), 1 ♀ (type) and 1 ♂.

This species is evidently a member of the subgenus *Phlebotomus* with an unusual combination of characters. In the key by Kirk and Lewis (1946) the female would not fit any of the sections; the male runs to section 8, differing from the second alternative in that the intermediate appendage is not simple.

We have pleasure in naming this species after Mrs. David Lewis, who has accompanied her husband on several collecting expeditions.

Phlebotomus (Prophlebotomus) cowlandi sp. n.

♂. Length: 2·0 mm. *Antenna*: formula 1/III–XV, segment III = 0·13 mm., <IV+V, shorter than epipharynx (A III/E = 0·9). *Palp*: formula 1, 2, 3, 4, 5, relative lengths of segments 1, 2·7, 4, 5·1, 8·3. *Epipharynx*: length 0·17 mm. *Buccal cavity*: with 25 teeth arranged on an arc strongly concave posteriorly, the outer five teeth on each side broad and each with several points, the central teeth narrow and pointed; no pigmented area.

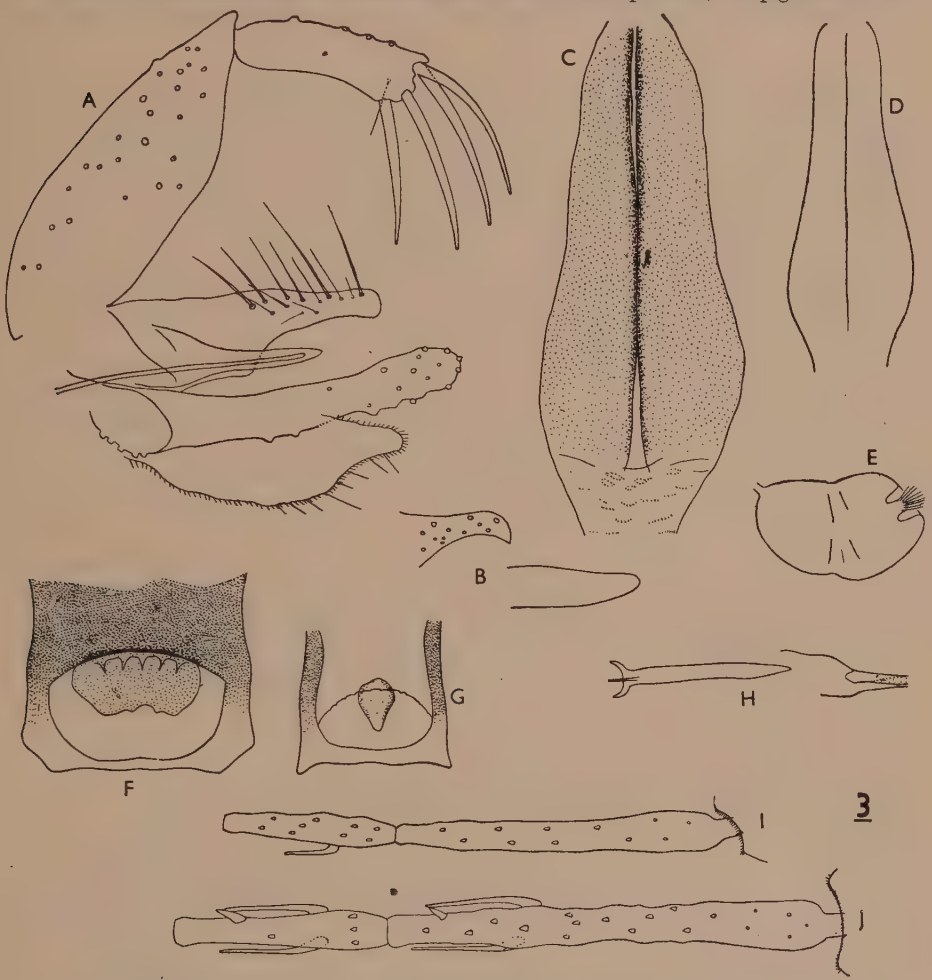

FIG. 3.—*Phlebotomus horgani* sp. n.: a, terminalia of ♂; b, tip of intermediate clasper and of intromittent organ showing variation in appearance due to position; c and d, pharynx of ♀ and of ♂; e, spermatheca; f and g, buccal cavity of ♀ and of ♂; h, pompetta; i and j, third and fourth antennal segments of ♂ and of ♀.

Pharynx: 1·5 times as wide posteriorly as anteriorly, posterior part armed with broad teeth anteriorly and minute spicules posteriorly. *Wing*: length 1·40 mm., breadth 0·35 mm., index 0·5, delta +0·03 mm. *Terminalia*: superior clasper I = 0·26 mm. (2·5 times as long as II), II = 0·10 mm., intermediate clasper 0·19 mm., inferior clasper 0·21 mm., intromittent organ 0·08 mm.; second segment of superior clasper bearing four terminal spines, small ventral seta at 0·9, intermediate clasper blunt, intromittent organ finger-shaped and blunt and with notch near tip.

♀. Unknown.

Anglo-Egyptian Sudan: Kassala Province, Gallabat, xi.38 (*M. M. Hassan*), 1 ♂.

This species runs to *P. congolensis* in the key to the males of *Prophlebotomus* by Kirk and Lewis but differs from that species in the shape of the buccal armature, intromittent organ and other characters.

We have pleasure in naming this species after Mr. J. W. Cowland, who has sent us many collections of sandflies.

Phlebotomus (Prophlebotomus) horgani sp. n.

♀. *Length*: 2·6 mm., hind leg 3·6 mm. *Antenna*: formula 2/III–XV, segment III = 0·20 mm., = IV + V, shorter than epipharynx (A III/E = 0·8); geniculate spine on IV about half length of segment, a short stout spine present near distal end of III and IV. *Palp*: formula 1, 2, (4, 3), 5, relative lengths of segments 1·0, 1·6, 2·4, 2·3, 5·0. *Epipharynx*: length 0·26 mm. *Buccal cavity*: about five delicate pointed teeth present (some may be lost), pigmented area narrow and with irregular posterior margin. *Pharynx*: 1·5 times as wide posteriorly as anteriorly, thin walled and pigmented, unarmed except for a few faint ridges and rows of minute spicules. *Wing*: length 1·8 mm., breadth 0·49 mm., index 0·8, delta + 0·14. *Spermatheca*: a thin-walled sac.

♂. *Length*: 1·8–2·1 mm., hind leg 2·5–2·7 mm. *Antenna*: formula 0/III, 1/IV–XV; segment III = 0·14–0·17 mm., < IV + V, shorter than epipharynx (A/E = 0·9); geniculate spine on IV = 0·25 length of segment. *Palp*: formula 1, 2, 3, 4, 5, relative lengths 1, 2·0, 3·4, 4·2, 8·4. *Epipharynx*: length 0·5–0·19 mm. *Buccal cavity*: teeth vestigial, pigmented area pear-shaped, narrow posteriorly. *Pharynx*: twice as wide posteriorly as anteriorly, unarmed and very lightly pigmented. *Wing*: length 1·3–1·6 mm., breadth 0·29–0·30 mm., index 0·7, delta + 0·5 to + 0·9. *Abdomen*: pompetta in segment V, lightly chitinised. *Terminalia*: superior clasper I = 0·19–0·20 mm. (about twice as long as II), II = 0·09–0·10 mm., intermediate clasper 0·10–0·14 mm., inferior clasper 0·17–0·19 mm., intromittent organ 0·08–0·09 mm.; superior clasper II bearing four terminal spines, the small ventral seta at 0·9 of length of segment; intermediate clasper hooked, intromittent organ conical and bluntly pointed but tip appearing sharp unless the specimen is flattened by pressure.

Anglo-Egyptian Sudan: Upper Nile Province, 121 kilometres up the Bahr El Zeraf (river), 15.i.40 (*D.J.L.*), 2 ♂ (including type), 1 ♀; Lake Jur, 9.i.40 (*D.J.L.*), 1 ♂: mouth of Bahr El Zeraf, 17.i.40 (*D.J.L.*), 1 ♂.

The female runs to section 8 in Kirk and Lewis's key to *Prophlebotomus*, differing from *P. yvonnae* in several characters; the male runs to section 3, differing from *P. wurtzi* in the presence of a pigmented area and in other features.

We have pleasure in naming this species after Dr. E. S. Horgan who, as head of the Stack Medical Research Laboratories, has given every encouragement to work on sandflies.

Phlebotomus (Prophlebotomus) hunti sp. n.

♀. A large dark sandfly. *Length*: 2·7–3·4 mm., hind leg 4·7–4·9 mm. *Antenna*: formula 2/III–IX (distal segments missing), segment III = 0·41–0·42 mm., > IV + V, longer than epipharynx (A III/E = 1·6); geniculate spine on IV = 0·3 length of segment. *Palp*: formula 1, 2, 3, 4, 5, relative lengths 1, 2·5, 3·8, 5·2, 9·0. *Epipharynx*: 0·26–0·29 mm. *Buccal cavity*: no large teeth present, many punctiform teeth arranged in two rows forming an arc convex posteriorly and additional broader punctiform teeth present at the sides; pigmented area very wide, its posterior margin smooth or irregular and concave or convex posteriorly. *Pharynx*: twice as wide posteriorly as anteriorly, constricted

just before posterior end, unarmed except for minute spicules. *Wing*: broad, length 2·21–2·36 mm., breadth 0·64–0·73 mm., index 2·2, delta + 0·44 to 0·55 mm. *Spermatheca*: thin walled and nearly cylindrical, narrowing towards duct.

♂. *Length*: 2·7–3·2 mm. *Antenna*: formula 1/III–V (other segments missing), segment III = 0·49 mm., > IV + V, longer than epipharynx (A III/E = 2·0); geniculate spine on IV = 0·2 of length of segment. *Palp*: formula 1, 2, 3, 4, 5, relative lengths of

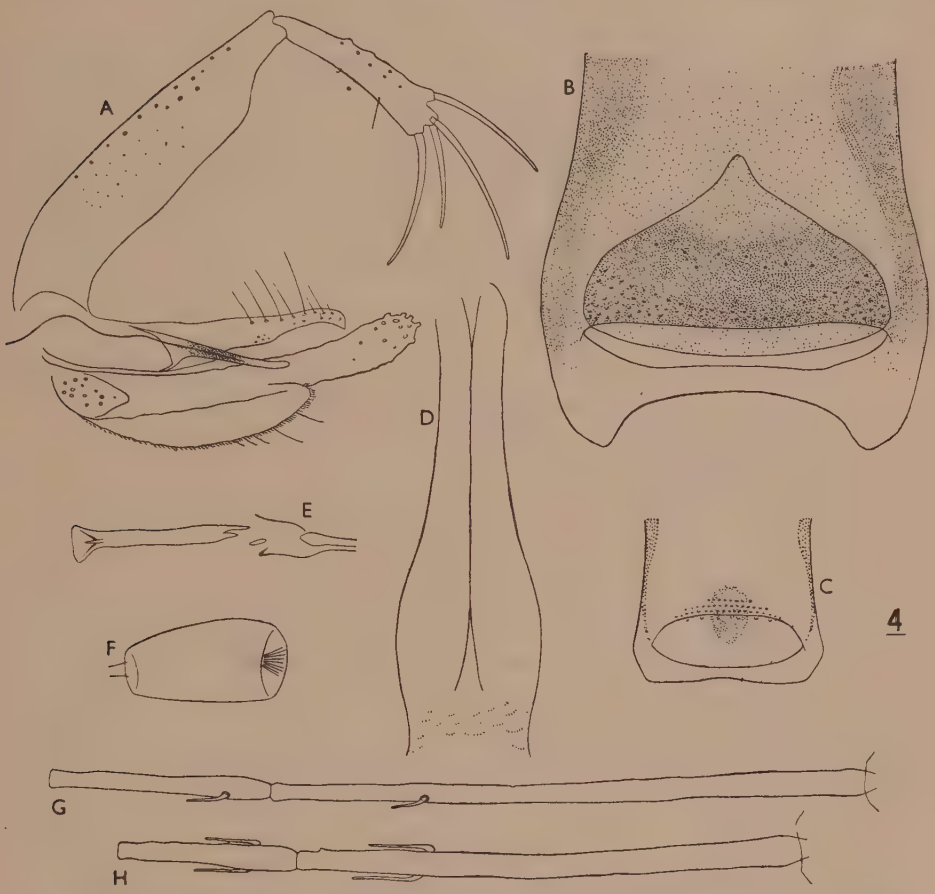

FIG. 4.—*Phlebotomus hunti* sp. n.: a, terminalia of ♂; b, buccal cavity of ♀; c, buccal cavity of ♂; d, pharynx of ♀; e, pompetta; f, spermatheca; g and h, third and fourth antennal segments of ♂ and ♀.

segments 1, 2·8, 4·5, 5·7, —. *Epipharynx*: length 0·24 mm. *Buccal cavity*: with four rows of punctiform teeth, pigmented area small, oval and ill-defined. *Pharynx*: as in ♀. *Wing*: length 2·13–2·36 mm., breadth 0·55–0·59 mm., index 2·1, delta + 0·41 to 0·43 mm. *Abdomen*: pompetta in segment VI. *Terminalia*: superior clasper I = 0·34–0·38 mm. (2·2 times as long as II), II = 0·16–0·17 mm., intermediate clasper 0·21–0·24 mm., inferior clasper 0·28–0·31 mm., intromittent organ 0·14–0·15 mm., superior clasper II bearing four terminal spines, the ventral seta at 0·7; intermediate clasper hooked, intromittent organ conical and bluntly pointed, pigmented at the centre and with clear tip.

Anglo-Egyptian Sudan: Equatoria Province, Sources Yubu, 10.viii.40 (*Dr. A. R. Hunt*), 3 ♂, 6 ♀ (including type).

The female runs to section 6 in Kirk and Lewis's key, and the male runs to section 16, each differing from the species indicated in having no large buccal teeth.

We have pleasure in naming this species after Dr. A. R. Hunt, who collected the type specimens and other sandflies.

Phlebotomus (Prophlebotomus) ruttledgei sp. n.

♀. *Length*: 1·8 mm., hind leg 2·2. *Antenna*: with short thick segments, formula 2/III–XII (other segments missing); segment III = 0·08 mm., < IV + V, shorter than epipharynx (A III/E = 0·5), geniculate spines on III nearly half length of segment and projecting beyond it, those on IV more than half length of segment. *Palp*: formula 1, 2, 3, 4, 5, relative lengths of segments, 1, 1·9, 3·1, 4·2, 8·8. *Epipharynx*: length 0·17 mm. *Buccal cavity*: about 50 very delicate teeth arranged on an arc deeply concave posteriorly, the outer teeth directed outwards, some ill-defined nodules at bases of some of the teeth; pigmented area with long anterior extension and very irregular posterior mar-

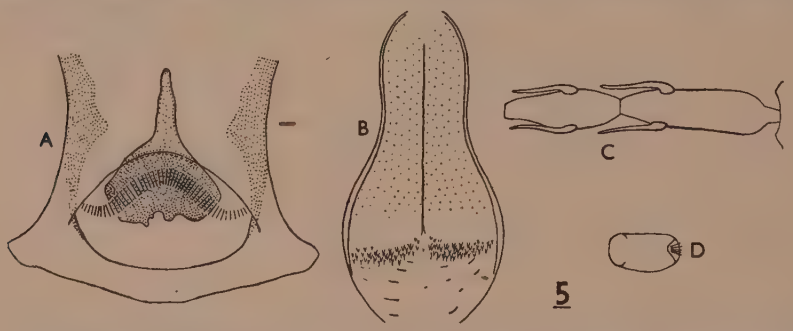

Fig. 5.—*Phlebotomus ruttledgei* sp. n., ♀: a, buccal cavity; b, pharynx, showing teeth of ventral plates; c, third and fourth segments of antenna; d, spermatheca.

gin. *Pharynx*: twice as wide posteriorly as anteriorly, somewhat constricted in middle, slightly pigmented in anterior two-thirds, dorsal plate with faint ridges, ventral plates with delicate but well-marked pointed teeth. *Wing*: length 1·37 mm., breadth 0·28 mm., index 0·6, delta + 0·03 mm. *Spermatheca*: without annulations.

♂. Unknown.

Anglo-Egyptian Sudan: Upper Nile Province, 121 kilometres up Bahr El Zeraf (river), 15.i.40 (*D.J.L.*), 1 ♀.

This species runs to section 8 in Kirk and Lewis's key, differing from the second alternative in the arrangement of its buccal teeth and other characters.

We have pleasure in naming this species after Mr. W. Ruttledge, who has sent us sandflies from many areas.

In the specimens described above the epipharynx has been measured from its base and not from the edge of the clypeus.

The figures are not drawn to scale.

The types described in this paper will be sent to the British Museum.

Reference.

Kirk, R., and Lewis, D. J., 1946, Taxonomy of Ethiopian sandflies (*Phlebotomus*). *Ann. trop. Med. Parasit.* [*In the press.*]

THE MALE OF *PHLEBOTOMUS SERRATUS* PARROT & MALBRANT (PSYCHODIDAE, DIPTERA)

By D. J. Lewis, F.R.E.S., and R. Kirk

(*Stack Medical Research Laboratories, Khartoum.*)

During the years 1940–1944 Parrot and Malbrant (1945) carried out a survey of the sandflies (*Phlebotomus*) of the French Congo. Among 582 specimens they found a single female of a new species, *P. serratus* Parrot & Malbrant 1945, which is readily distinguished from all the known species of *Phlebotomus*

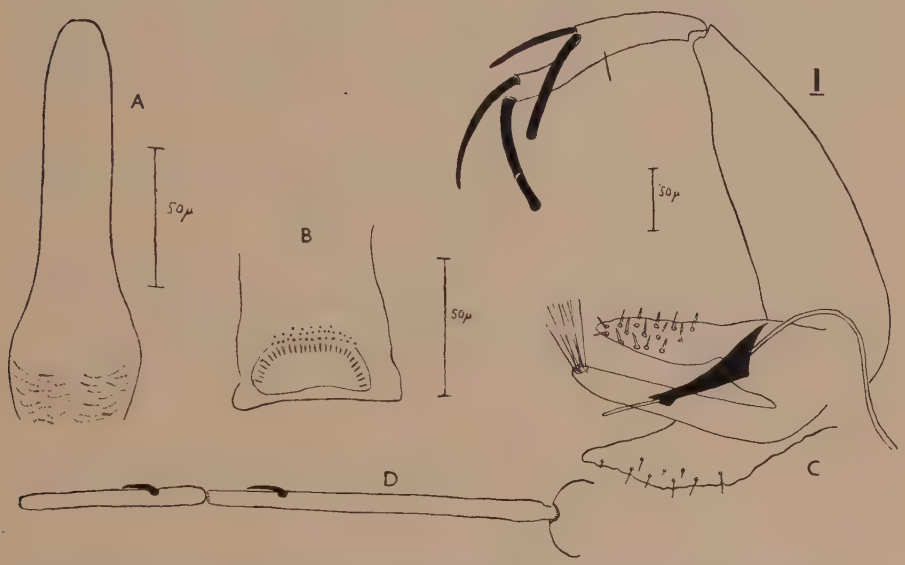

Fig. 1.—*Phlebotomus serratus* Parrot & Malbrant, ♂: a, pharynx; b, buccal cavity; c, terminalia; d, third and fourth segments of antenna.

by the morphology of the buccal cavity. In May 1945 we obtained five females and seven males of this species in the Sudan. The females correspond in appearance and measurements with Parrot and Malbrant's description of the type specimen. The description of the male is given below.

Phlebotomus (*Prophlebotomus*) *serratus* Parrot & Malbrant.

♂. *Length*: 2·0–2·4 mm. *Hind leg*: length, 2·8–3·0 mm. *Antenna*: formula $\frac{\text{I}}{\text{III–XV}}$; segment III (0·22–0·27 mm.) $\geqq$ IV + V, longer than epipharynx (A III/E = 1·7–1·8);

the geniculate spine on segment IV measures about 0·2 of the length of the segment, but those on some of the more distal segments are relatively longer. *Palp*: formula, 1, 2, 3, 4, 5, the relative lengths of the segments being 1–3–5–6–10. *Epipharynx*: length 0·13–0·15 mm. *Buccal cavity*: bears a row of about 35 straight, narrow teeth arranged in an arc strongly concave posteriorly, with two irregular rows of anterior punctiform teeth and sometimes occasional members of a third row; pigmented area absent. *Pharynx*: about one and a half times as broad posteriorly as anteriorly, armed in its posterior part with faint wavy transverse ridges and small punctiform teeth. *Abdomen*: pompetta lies in segments VI and VII. *Terminalia*: superior clasper i (0·3–0·32 mm.) about one and a half times as long as ii (0·15–0·2 mm.), intermediate clasper (0·18–0·2 mm.) broad and rather lance-shaped; intromittent organ (0·1–0·11 mm.) conical, with expanded distal extremity; inferior clasper (0·2 mm.) bears a tuft of six strong hairs at its distal extremity. *Wing*: length 1·86–2·14 mm., breadth 0·43–0·56 mm., delta = +0·08–0·17, alar index (alpha/beta) = 0·71–1·0.

Anglo-Egyptian Sudan: Equatoria Province, at Gilo in the Imatong Mountains (6500 ft.), v.45 (*R.K.*), 5 ♀, 7 ♂. The specimens were all obtained from a cleft in a hollow tree near ground level by means of oiled paper traps (Kirk and Lewis, 1940). It is intended to send them to the British Museum.

In external characters ♂ *P. serratus* resembles ♂ *P. ingrami*, and would run to section 12 in Kirk and Lewis's (1946) key, after which it is readily distinguished from *P. ingrami* by the morphology of the buccal teeth.

References.

Kirk, R., and Lewis, D. J., 1940, Studies in Leishmaniasis in the Anglo-Egyptian Sudan. III.—The sandflies (*Phlebotomus*) of the Sudan. *Trans. R. Soc. trop. Med. Hyg.* **33**: 623.

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Parrot, L., and Malbrant, R., 1945, Notes sur les Phlébotomes. XLVII. Phlébotomes du Moyen Congo. *Arch. Inst. Pasteur Alger.* **23**: 121.

AFRICAN NOMIINE BEES (HYMENOPTERA)

By Professor T. D. A. Cockerell, F.R.E.S.

Nomia circumnitens sp. n.

♂. Length 10 mm., anterior wing 8·5 mm.; rather robust, black, including the strongly curved mandibles; flagellum long, dusky reddish beneath; face densely covered with pale flavescent hair; vertex dull; thorax with abundant erect dull flavescent hair, not hiding surface of mesonotum, some dark hairs intermixed above; mesonotum and scutellum dull; base of metathorax with a channel crossed by ridges; tegulae small, dark brown, with a broad pale anterior border; wings rather dilute fuliginous, hardly more darkened at end; stigma small, obtuse, reddish with a dark border; second submarginal cell square, receiving recurrent nervure well beyond middle; nervures dark; legs black, including the long slender tarsi, on the inner side of which the hair is reddish; hind femora moderately swollen, having beneath two oblique teeth, the first small; abdomen without hair-bands, but some long hairs at sides; second to fourth tergites with very broad, shining, brownish hind margins, the black part before these margins strongly punctured; sides of apical part with dark hairs; venter with long fulvescent hair.

Zululand: Eshowe, 23–31 March, 1926 (*R. E. Turner*). Also a cotype from Port St. John, Pondoland, Feb. 1924 (*R. E. Turner*). This runs out in all tables; there is some resemblance to *N. matha* Cameron, which has abdominal hair-bands, and quite a different stigma.

Nomia melanosticta sp. n.

♀. Length about 9 mm., anterior wing about 7 mm.; black, robust, with pale pubescence, abundant and erect on thorax above, but not hiding the surface; mandibles and antennae black; head broad; mesonotum and scutellum dull; base of metathorax with a narrow channel; tegulae dark brown, with a broad hyaline margin; wings hyaline, the apical field faintly dusky; stigma light ferruginous, nervures dark; second submarginal cell broad, receiving recurrent nervure a little beyond the middle; legs with the tarsi and the hind tibiae red, the hind basitarsi with a large black spot near the end; abdomen broad, little shining, first tergite with a little pale hair at extreme sides; the margin of the first tergite is very narrowly pallid, of the others more broadly so, the second with white hair-bands at sides, the third and fourth with entire white hair-bands, that on fourth quite broad; apex with light red hair.

Natal: Van Reenen, Drakensberg, Dec. 1926 (*R. E. Turner*). Also two cotypes, with the abdomen not so distinctly red at end, from Harrismith, Orange Free State, Feb. 1927 (*R. E. Turner*). At first sight, this reminded me of *N. rufitarsis* Smith, but it is actually closely allied to *N. dominarum* Cockerell, which is considerably larger, and has thick hair-bands on the second and following tergites.

Nomia gastrodonta sp. n.

♂. Length about 10 mm.; black, the abdominal tergites with apical bands of dense pure white tomentum; mandibles red; face densely covered with pure white hair, wholly concealing the surface; antennae broken in type, but entirely black to third flagellar joint; vertex dull; mesonotum and scutellum strongly punctured, very little shining, with thin short hair, not at all hiding the surface; band on upper margin of prothorax, narrow band

on postscutellum, pleura and sides of metathorax, with pure white hair; base of metathorax a narrow channel, strongly plicate; wings dilute fuliginous, darker at end; stigma red; nervures dark, second submarginal cell broad, receiving recurrent nervure not far from end; tegulae red; anterior knees, tibiae and tarsi bright ferruginous; middle tibiae black on outer side, but largely red on inner, and the tarsi red; hind femora swollen, rounded above, black with conspicuous white hair on apical slope; hind tibiae with more than half red, and tarsi red; abdominal tergites strongly constricted at base; the fifth with a strong spine beneath at each side; apical plate red.

Cape Province: Somerset East, Nov. 1930 (*R. E. Turner*). This will be readily known by the abdominal bands of snow-white tomentum, the spines on underside of abdomen (compare *N. momotina* Cockerell), and the pattern of the legs. I had to consider whether it could be the male of *N. obscurescens* Cockerell, which was described from the females taken at Somerset East, but this seems improbable.

N. tridentata var. *digitata* Friese, from Algoa Bay, has clear white hair-bands on abdomen, but it is a different species. It has much pure white hair on basal part of first tergite; hair of thorax above short, largely fibrous, moss-like; stigma dark reddish, fairly well developed; face with white hair; flagellum very dark brown beneath. Apparently to be called *N. digitata*. I examined a specimen in the American Museum collection, received from Friese.

Nomia natalensis (Cockerell).

♀. Pondoland: Port St. John, 1–17 March, 1924 (*R. E. Turner*).

Nomia capensis Friese.

♂. Umtata: Transkei, Feb.–March 1923 (*R. E. Turner*).

Nomia perornata Cockerell.

Gold Coast: Yapi, ♀ (*J. J. Simpson*). Two: one is dated Dec. 1916 S. Africa: Umtata, Transkei, ♀, Feb.–March 1923 (*R. E. Turner*).

Nomia mengonis sp. n.

♂. Length about 8·5 mm., length of anterior wing the same, the wings being very long; head and thorax black, with short dense fulvous pubescence, covering face and front, a line on upper border of pronotum, a band on hind border of mesonotum, postscutellum, base and sides of metathorax, region of tubercles, and more thinly on pleura; face contracted below; antennae red, the flagellum dusky above; mesonotum shining, but not polished; scutellum bigibbous, the elevations shining; tegulae clear red, rather large, but not of the large type; wings hyaline, with a large fuliginous cloud including the apex of the marginal cell; stigma clear red; second submarginal cell very narrow, receiving recurrent nervure before end; third submarginal cell large and long; legs entirely clear red, hind femora not enlarged, hind tibiae broad, with a large apical projection; abdomen entirely dusky red, the hind margins of the tergites broad and shining pale golden.

Uganda: Kampala, 4–10 Feb., 1919 (*C. C. Gowdey*). Belongs to the group of *N. nubecula* Smith and *N. rubribasis* Cockerell, easily distinguished from these species by the red abdomen.

Nomia wellmani Cockerell.

♀. Uganda (*Neave*). One from Ankole–Toro Border, E. of Lake George, 4500 ft., 20–21 Oct., 1911; one from South Toro, Mbarare, Ft. Portal Road, 3800–4200 ft., 22–24 Oct., 1911.

Nomia patellifera Westwood.

♂. Cape Province: Katberg, 19–26 Feb., 1933 (*R. E. Turner*).

Nomia fortis sp. n.

♂. Length about 11 mm., anterior wing 8·6 mm.; a species of the group of *N. patellifera* Westwood, with the same broad white anterior tarsi; wings fuliginous; hair of face and front pale yellowish; antennae broken, but what is left of the flagellum is not brightly coloured beneath; hair of upper margin of prothorax greyish-white; scutellum shining, bigibbous; tegulae black; the thick hind femora, seen in lateral profile, rounded, black with about the basal third pale yellowish-red, the red not reaching the top of the elevation; hind tibiae white apically, but not white to base above; mid trochanters and femora light red, but their tibiae black on outer side; middle basitarsi densely covered with light hair; front femora red beneath.

Uganda: Kampala, 4 Dec. 1918 (*C. C. Gowdey*).

Nomia debilior sp. n.

♂. Length about 9 mm., anterior wing 7·4 mm.; a species of the group of *N. patellifera* Westwood, with the same modified front legs; wings dilute fuliginous, tegulae red; hair of face and front pale dull yellow, of upper border of prothorax greyish-white; hind femora distinctly humped, light red with the posterior face broadly black; hind tibiae red anteriorly and apically white, with a very long apical process; anterior and middle femora and tibiae red, the tibiae with a blackish stain at apex; middle and hind basitarsi white.

Uganda: Kampala, 4 Dec., 1918 (*C. C. Gowdey*). I had at first regarded these as varieties of *N. patellifera*, but I think they must stand as distinct species.

In my table in 1933, *Rev. zool. bot. Afric.* **24**: 177, *N. fortis* goes to *N. rotundata* Cockerell, but is considerably larger. *N. debilior* goes to *N. sordida* Cockerell, but is smaller; both differ in other small details. It is possible that when larger series are obtained, it may be found desirable to regard all these forms of the *N. patellifera* group as races or subspecies. The present treatment of the group must be regarded as provisional.

Nomia laticauda sp. n.

♀. Length about 6·5 mm., anterior wing 5·3 mm.; black, including mandibles and antennae, but tarsi red; pubescence dull white, quite abundant on face; head broad; mesonotum dull, but scutellum shining; tegulae dark brown, not enlarged; wings hyaline, faintly dusky, but not darkened at end; stigma large, pale reddish; nervures rather pale; basal nervure strongly bent at lower end; second submarginal cell receiving recurrent nervure beyond the middle; abdomen very broad, not evidently banded, but apical margins of tergites 3 to 5 suffusedly pallid; last ventral segment projecting as if a broad rounded apical plate.

Katanga: Lubumbashi, 18 March, 1921 (*Michael Bequaert*). Not closely allied to any described Katanga species. In my key in 1935, *Ann. Mag. nat.*

Hist. (10) **15** : 162–166, it runs near *N. microsoma* Cockerell, from Tanga, differing by the black mandibles and antennae, dull mesonotum, and other characters. There is perhaps some affinity with *N. zuala* Strand.

Nomia johannis sp. n.

♀. Length 10 mm., anterior wing 8 mm.; robust, black, the head and thorax with rather scanty hair, on thorax faintly fulvescent dorsally, white at sides, on scutellum not hiding the surface, but dense on postscutellum; a clear white line at each side of scutellum, and a small white mark at each side of postscutellum; head broad; mandibles black, exceedingly large and long; clypeus rugoso-punctate, not polished; antennae black; mesonotum moderately shining, but not at all polished; base of metathorax with a narrow, somewhat shining, channel; tegulae small and black; wings somewhat dusky, but not dark, and with no apical cloud; stigma black; nervures dark; second submarginal cell very broad, receiving recurrent nervure some distance from end; legs black; hair on inner side of hind tibiae and tarsi pale, a little fulvescent; abdomen broad, with white hair at extreme base; margins of tergites pale greyish, of first narrowly, of second and third much broader, of fourth narrow; apex with greyish-brown hair.

Pondoland : Port St. John, 1–17 March, 1924 (*R. E. Turner*). It is very like what I have as *N. rothkirchi* Friese, but has a broader abdomen, shining (though not polished) mesonotum, and no white band at upper border of pronotum. They agree in venation, with broad second submarginal cell. The black stigma and tomentose postscutellum distinguish it from *N. patellifera* Westwood. My specimen of *N. rothkirchi* was received from Friese, and so ought to be authentic, but it was collected by Volkmann at Grotfontein, S.W. Africa, whereas the original *N. rothkirchi* came from the Cameroons. Strand described *N. tetraloniformis*, with small black tegulae, and end of abdomen golden haired. Hedicke, after comparing the types in Berlin, wrote that Strand's species (which has two years' priority) was the same as *N. rothkirchi*.

Nomia siapungensis sp. n.

♀. Length about 6 mm., anterior wing 5·5 mm.; tegulae small and dark; pubescence scanty, conspicuously pale on face and cheeks; head and thorax black, the head large and broad; a shining area behind the top of each eye; flagellum thick, pale reddish beneath; mesonotum, scutellum, and upper part of sides of metathorax, highly polished; wings hyaline, the outer field distinctly dusky; stigma rather pale brown; nervures pale; basal nervure only gently arched; second submarginal cell rather narrow, receiving recurrent nervure about middle; legs with the tibiae and tarsi brown; abdomen pale reddish, suffusedly dusky towards the end, but with no dark bands; first two tergites with shining, pallid, margins, the following ones with a little hair on margins; venter with long hair.

N. Rhodesia : Siapunga, 13 Feb., 1911, three collected by Silverlock. Nearest to *N. politula* Cockerell, but that has a much broader abdomen, with dusky bands. In my table in 1935, *Ann. Mag. nat. Hist.* (10) **15** : 162–166, it runs out at 32. A specimen collected by Silverlock at Pakasa, N. Rhodesia, 23 Jan., 1911, is a little larger, and the abdomen is missing. It appears to be the same species. There is some resemblance to *N. semirufa* Friese, from Bulawayo. This has the stigma light fulvous; face broad; first tergite black except broad hind margin and a pointed mark entering the black on each side; a little transverse band of dense pure white hair at each side of scutellum; wings brownish, second submarginal cell receiving recurrent nervure about middle.

Nomia vulpina Gerstaecker.

Lualaba River, 2500–4000 ft., Aug. 1907 (*Neave*); Mombasa, 1 May, 1927 (*J. Bequaert*); Central Angoniland, Dedza District, 4000–5000 ft., 21–27 May, 1910 (*Neave*). The last is unusually large. PORTUGUESE E. AFRICA: Valley of Kola River, near E. Mt. Chiperone, 1500–2000 ft., 9 April, 1913 (*Neave*).

Nomia concinnula Cockerell.

NYASALAND: Lingadzi, near Domira Bay, 1670 to 1700 ft., 26 Feb. to 12 March, "in tsetse area" (*Dr. W. A. Lamborn*). Six males and two females. The female is easily known from *N. junodiella* Friese and *N. hylaeoides* Gerstäcker by the polished, greenish mesonotum. I believe that *N. concinnula* will prove identical with the prior *N. chalconota* Gribodo.

TERMITES FROM BRITISH SOMALILAND (ISOPTERA)

By W. Victor HARRIS, F.R.E.S.

THE following termites were collected by Major P. E. Glover in British Somaliland. I have been unable to trace any previously published records from that country, though the species now listed are, with one exception, known from adjacent territories.

HODOTERMITIDAE.

Hodotermes erithreensis minor subsp. n.

Soldier—head a light orange colour, with posterior well rounded and sides lightly compressed towards the base of the mandibles. Mandibles dark brown to black, except towards the base where they are orange; the left mandible longer than the right, both with long incurving points; the left with three teeth, the right with two, the outermost being the largest in both cases. Antennae composed of 26 segments, the basal segment being as long as the following three together, II as long as III and IV together, and III, IV and V each approximately equal. Eyes black, not quite circular, the longer axis 0·24 mm. Prothorax with a slight median notch on the anterior lobe, and a large notch on the posterior lobe; lateral lobes prominent. Legs and body pale yellow. Head with mandibles 4·5 mm.; length of head 2·6 mm.; width of head 2·5 mm.; length of left mandible 2·5 mm.; width of prothorax 2·0 mm.

Differs from *H. erithreensis* Sjöstedt (1912, *Ark. Zool.* **7** (27): 2) from Eritrea, in being much smaller and in having fewer antennal segments. As only one (type) of three soldiers examined had complete antennae, there may be some variation in number of segments.

Worker—as for *H. erithreensis*, including 29-segmented antennae, but smaller in size. Width of head, larger form, 2·7 mm.; width of head, smaller form, 2·0 mm.

Type locality.—BRITISH SOMALILAND: Alabla Balleh (*P. E. Glover*), 6 November, 1945; three soldiers and a number of workers.

TERMITIDAE.

Bellicositermes bellicosus Smeathman.

Duruksi, November, 1945. Large and small soldiers and workers agreeing closely with specimens from East Africa. Major Glover in his notes on these specimens says " From mounds which are very conspicuous . . . sometimes reaching a height of 30 feet or more . . . occurs very frequently all over the Haud, often to the extent of 2 or 3 to the acre . . . they vary from 3 to 6 or 10 feet basal diameter and usually taper towards the top."

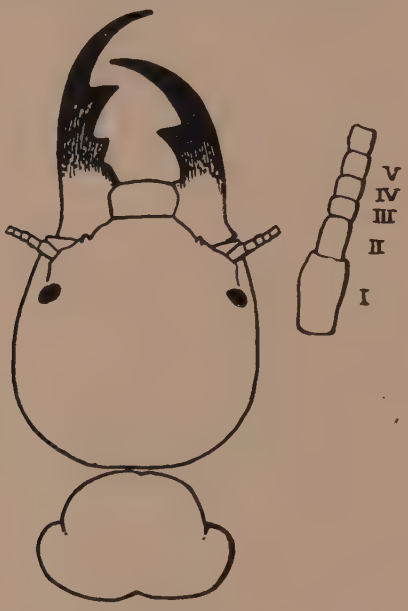


FIG. 1.—*H. erithreensis minor* subsp. n., head and prothorax of soldier.

Termes classicus Sjöstedt.

Sirau Balleh, 12 November, 1945, attacking dead wood on the ground.

Duruksi, 18 November, 1945, attacking a wooden box.

Alabla Balleh, 6 November, 1945, from an almost spherical fungus garden found in a chamber two feet below the ground.

This species was described by Sjöstedt (*loc. cit.*) from Bogos, Keren, Eritrea. Paoli (1933, *Entomologia Agraria della Somalia Italiana*) found it to be the commonest termite associated with cultivation at Villagio Duca degli Abruzzi, feeding on dry vegetation as well as on living plants.

UNDESCRIBED FORMS OF *CAMPONOTUS* (*COLOBOPSIS*) *VITIENSIS* FROM THE FIJI ISLANDS (HYMENOPTERA, FORMICIDAE)

By Horace Donisthorpe, F.Z.S., F.R.E.S.

Camponotus (*Colobopsis*) *vitiensis* Mann.

1921, *Bull. Mus. comp. Zool.* **64** : 490.

☙. Shining black, mandibles brownish-red, tip of last joint of antennae, and last joint of tarsi, lighter red. Furnished with very sparse short erect black hairs on head and gaster. Sculpture very finely coriaceous, with very small, fairly close, shallow punctures, some 4 or 5 larger punctures extend along the frontal carinae, and 2 setiferous punctures are situated on each side, inside the frontal carinae before sinuation at the base. *Head* longer than broad, narrower at apex than at base, posterior angles rounded, posterior border widely excised. Anterior portion of head flat, sloping not very abruptly from apex of frontal carinae to anterior border of clypeus, with a shallow fovea on each side about the middle of sides; *mandibles* powerful, triangular, longitudinally striate and punctured, masticatory border armed with 3 large teeth at apex, the apical one longer and sharper than the other two, the second longer than the third, rest of border bearing some 10 considerably smaller teeth; *clypeus* flat, smooth and shining, anterior border slightly projecting, round, bisinuate at each side; *frontal area* indistinct; *frontal furrow* short, somewhat deep; *frontal carinae* not much raised, divergent posteriorly, and sinuate at base; *eyes* moderate, round oval, slightly prominent; *antennae* moderate, inserted at about the middle of the frontal carinae, *scape* narrow and curved at apex, thickened to base, finely punctured, not reaching posterior border of head, *funiculus* pubescent, all the joints longer than broad, last joint finely pointed, slightly longer than the two preceding taken together. *Thorax* robust, convex, broader anteriorly than posteriorly; *pronotum* convex, narrowly margined at apex and sides, sides rounded, contracted in front and behind, broadest about middle, encircling mesonotum; *mesonotum* convex, somewhat prominent, slightly higher than pronotum, anterior border round, posterior border almost straight; *metanotum* narrow, but distinct, slightly raised; *epinotum* prominent, convex, rounded, dorsal surface rather flat on disc, about the same length as declivity, angle between dorsal surface and declivity well marked but rounded, declivity flat but slightly concave at base, posterior border margined and raised in centre. *Petiole* with node longer than high in profile, anterior surface flat, rounded at sides, posterior surface somewhat concave, upper surface excised in middle with side angles forming blunt round points, or, as Mann describes them in the ♀, short blunt cones; *gaster* moderate, somewhat flat, long oval, anterior border and angles rounded, bluntly pointed at apex. *Legs* moderate, femora and tibiae strongly compressed. *Long.* 9·9 mm.

More shining than worker, posterior margin of epinotum, node of petiole, and femora and tibiae, constructed as in worker.

♀. Shining black, structure, sculpture, hairs, etc., much as in ☙. *Head* more massive and somewhat longer in proportion than in ☙, posterior border less excised, the sloping anterior part of head similar, the two shallow foveae somewhat more distinct; *mandibles* more massive, darker in colour, masticatory border armed with some 6 or 7 strong teeth, increasing in length and sharpness to apex; *eyes* somewhat larger in proportion; *ocelli* moderate; *antennae* longer in proportion, inserted at about the middle of the frontal carinae, *scape* extending beyond posterior border of head. *Thorax* somewhat narrow, longer than broad, broadest just before insertion of fore-wings, narrowed in front and behind; *pronotum* transverse, considerably narrowed anteriorly, anterior border and

sides narrowly margined, encircling mesonotum; *mesonotum* larger, longer and higher than pronotum, rather flat on scutum, anterior border and sides rounded, two very shallow narrow, not very distinct, divergent longitudinal impressions extending a short distance from anterior border on scutum, posterior border separated from praescutellum by a very narrow waved suture, no distinct suture between *praescutellum* and scutellum; *scutellum* not prominent, somewhat flat on disc, level in profile with mesonotum, rounded posteriorly, sides sloping, posterior border margined and raised at sides; *metanotum* narrow, somewhat raised, separated from scutellum and epinotum by rather deep sutures; *epinotum* transverse, dorsal surface flat, somewhat shorter than declivity, angle between dorsal surface and declivity well marked but rounded, declivity flat in middle, posterior border margined and slightly raised in centre. *Petiolar node* transverse, anterior surface convex, posterior surface flat, upper surface raised in middle, sinuate at sides, side angled forming somewhat sharp points; *gaster* long, oval, fairly large, longer and broader than rest of body, somewhat flat above, pointed at apex. *Legs* fairly long, femora and tibiae compressed. *Wings* ample, yellowish, pterostigma and veins light brownish-yellow, typical *Camponotus* wings, fore-wing with one cubital, long closed radial, but no discoidal cell present. *Long.* 16 mm.

♂. Black, rather dull except gaster, legs and scape of antennae dark brown, mandibles, funiculus, tarsi and genitalia yellowish, whole body finely coriaceous. *Head* triangular, narrowed anteriorly, posterior border round, posterior angles rounded; *mandibles* narrow, triangular, masticatory border armed with 3 or 4 teeth; *clypeus* transverse, rather large, anterior border round, sinuate at sides, posterior border almost straight; *frontal area* indistinct; *frontal furrow* fine, narrow, reaching median ocellus; *frontal carinae* short, rather flat, divergent posteriorly; *ocelli* moderate; eyes large, round oval, very prominent; *antennae* long, *scape* extending considerably beyond posterior border of head, *funiculus* with all joints elongate, narrowed to apex, first joint swollen at apex, last joint not longer than the two preceding taken together. *Thorax* longer than broad, narrowed in front and behind, broadest before insertion of fore-wings; *pronotum* short, transverse, narrowed and finely margined anteriorly; *mesonotum* large, convex, prominent, anterior border and sides rounded, posterior border almost straight, two very narrow, smooth, longitudinal spaces divergent posteriorly, extending on to disc of scutum; *praescutellum* narrow, transverse, smooth, separated from mesonotum and scutellum by very fine but distinct sutures; *scutellum* convex, moderately prominent, flat and level with mesonotum anteriorly; *metanotum* narrow, transverse, raised, separated from scutellum and epinotum by rather deep sutures; *epinotum* convex, narrowed to base, sloping, angle between dorsal surface and declivity not defined, posterior border finely margined. *Node* of *Petiole* slightly longer than high in profile, anterior surface flat, posterior surface slightly convex, shorter than anterior surface, upper surface slightly excised in middle; *gaster* long oval, narrowed to apex; *genitalia* exserted, typical camponotine. *Legs* long, slender, femora and tibiae compressed. *Wings* as in ♀, but smaller in proportion, paler and iridescent. *Long.* 8 mm.

Described from one soldier, three-winged females and one male, taken by R. A. Lever on a tree in company with seven workers, on Mt. Evans, Fiji, No. H.706.

Soldier, female, and male types in British Museum (Natural History).

This species was first described by W. H. Mann from a large series of workers found on the ground and on the trunks of kauri trees at Viti Levu: Nadarivatu, Fiji.

Mann remarks that the nests are probably situated high up in these kauri trees. He also says: "As they run about, the workers elevate the gaster and carry it held forward over the thorax."

SUPPLEMENTARY NOTES ON THE CLASSIFICATION OF ARGYNNINAE (LEPIDOPTERA, NYMPHALIDAE)

By B. C. S. Warren, Cyril F. dos Passos and Lionel P. Grey.

In the years 1944 and 1945 two papers were published by the present authors, independently, one by Warren (1944, Review of the classification of the Argynnidi : with a systematic revision of the genus *Boloria*, *Trans. R. ent. Soc. Lond.* **94** : 1–101, pls. 1–46, figs. 1–317), the other by Cyril F. dos Passos and Lionel P. Grey (1945, A genitalic survey of Argynninae, *Amer. Mus. Nov.* **1296** : 1–29, figs. 1–54). Both papers had been completed before the authors became aware that a contemporaneous study of the classification of Argynninae had been made. Warren's paper appeared in time for dos Passos and Grey to read and to add a short commentary on it at the end of their paper, which went to press without other alteration. Warren's revision included an exposition of the researches previously made by Reuss on Argynninae (published during the past twenty years in isolated papers) together with the results of his own work.

The two papers, therefore, presented the results of three independent genitalic studies of Argynninae; the work of men of three different nationalities. That the classifications adopted from these three standpoints coincided in all essentials is, we feel, not only a remarkable testimony to the taxonomic value of morphological data, but also a striking confirmation of the interpretation of such data by the individual authors.

That divergences of views appear at some points is not surprising; indeed, it would almost appear inevitable between works prepared under such totally different circumstances on different continents, but for this very reason when divergence seems strongest in reality it is only the natural consequence of the differing aims the authors had in view. To the reader of those papers this might not be apparent. To the authors, however, the divergence of method merely proved that a necessary step in the general scheme of classification had been omitted, though clearly indicated in the system followed in both papers.

The present paper, therefore, has been prepared by the authors in collaboration for two main reasons : first, the desirability of clarifying and establishing the scheme of classification of Argynninae founded on data the value of which they believe cannot be contested, and secondly, to remove any uncertainty that might be caused by the apparent divergence in the use of the name *Boloria* in their previous papers.

To start with it must be recalled that, in their paper, dos Passos and Grey were concerned primarily with the study of the species of the genus *Speyeria*. The anatomical data they amassed gave very obvious results and proved that the Nearctic species as a whole divided sharply into two sections : (A) those belonging to the genus *Speyeria* and (B) those that do not. So incontestable was this division that since the species of section (B) were outside the particular scope of their work, the authors found it convenient to group them collectively as the genus *Boloria*. As the remaining Old World genera,

in spite of the degree of specialisation in which they stand apart from each other, all agreed with *Speyeria* in differing from *Boloria* dos Passos and Grey in a common character, it was evident that some tribal division of the subfamily was indicated.

Conversely Warren's primary object was a revision of the group of species known in Europe as the "*pales* group," *i.e.*, the type species of the genus *Boloria* and its closest relations. It, therefore, was necessary for him to follow the phylogeny of the related Bolorian species groups as far as possible, which naturally led to the use of *Boloria* in its strictly typical and restricted sense, thus throwing more prominence on the segregation of the Bolorian specific groups rather than their affinities. The resulting order of classification employed in each paper is, however, the same.

The fact then that *Boloria* of dos Passos and Grey was shown by Reuss and Warren to cover other species distinct from typical *Boloria* indicated that the character employed by dos Passos and Grey was of tribal rather than generic rank, a view which is fully confirmed by the union of the non-Bolorian genera on the same basis. The existence then of two fundamentally differing generic groups within the subfamily is at once obvious.

The importance of this great division needs emphasising, for its recognition will unquestionably help the general collector to grasp how widely separated are some genera that have been erroneously united in the past. To the student it will be of considerable interest as an indication of the lines along which some of the earliest stages in the evolution of these now widely separated genera were attained. Therefore, we propose to introduce a second tribal division into the subfamily as **Boloriidi**. Consequently the tribal characters as given by Warren (*loc. cit.* : 6), covering as they do both the new Boloriidi and the restricted Argynnidi, now give us the true limits of the subfamily.

The subfamily Argynninae and its two tribes will be recognised, therefore, as follows :—

Subfamily Argynninae : dorsal area of 9th tergum membranous (non-chitinised) centrally; terminal (distal) process of harpe external to the clasper.

These characters separate true Argynninae very distinctly. The genus *Euptoieta* is excluded though showing some affinity; dos Passos and Grey had previously come to the conclusion that this genus was incorrectly placed in the subfamily and was really a link between it and Heliconiinae. The characters of our definition clearly corroborate this idea. Another useful result is the exclusion of Melitaeidi. The five (or six) genera of that tribe will now have to be placed in a separate subfamily—a change long overdue—for they show but little more affinity with true Argynninae than do Vanessinae.

Tribe **Boloriidi** : proximal end of aedaegus closed.

This tribe includes the genera *Boloria*, *Proclossiana*, and *Clossiana*. Both *Boloria* and *Proclossiana* are sharply defined, but *Clossiana* includes a large number of Palaearctic and Nearctic species that are at present insufficiently known to permit a confident assertion that all are correctly placed in this genus. Both dos Passos and Grey feel that *Clossiana* as now constituted is heterogeneous and that new genera may be needed when the circumpolar and Asiatic species have been studied.

Tribe Argynnidi: proximal end of aedeagus open.

This tribe includes the following genera: *Brenthis*, *Yramea*, *Issoria*, *Speyeria*, *Fabriciana*, *Mesoacidalia*, *Damora*, *Argynnis*, *Pandoriana*, *Childrena*, *Argyreus*, and *Argyronome*.

The authors are in agreement as to the probable sequence, and believe that the one given above may finally be adopted. This list differs from that given by Warren in the inclusion of *Yramea*, with which both he and Reuss were unfamiliar. *Yramea* is not well known, only one species having thus far been studied. Possibly there are other species in the Andes which may not agree with the diagnosis of *Yramea*. We also use *Speyeria* in place of *Neoacidalia* Reuss. The latter is a synonym of *Speyeria* and we cannot at present say how Reuss overlooked the fact, or what the four Asiatic species were that he included. So far as we know, *Speyeria* is entirely a New World genus. The genus *Brenthis*, on the other hand, is restricted to the Old World and is one of the most widely detached of the Argynnid genera. Considering the number of species that have at one time or another been included in *Brenthis*, it is well to emphasise this point. It has been placed first in the Argynnidi, owing to its being the only genus of the tribe in which the uncus is divided at its termination. The type of uncus, however, actually further emphasises its isolated position, for its triple, downward-curving, blunt terminal prongs are an elaboration of that process which, so far as we know, is unique in the Rhopalocera; there is little affinity with the simple, terminal bisection normal to the Bolorian uncus other than the fact that it is divided. We call attention to the fact that fig. 29 given by Warren (*loc. cit.*) is the only one that illustrates the uncus of *Brenthis* in undistorted appearance; all other figures, though rendering the trifid extremity of the uncus clearly observable, are misleading in that the curvature of the prongs has been destroyed by the method of mounting the specimens. A divided uncus of any type is apparently correlated to some extent with the absence of gnathic structures in so far that a split uncus is unknown in any species where gnathic processes of any type exist. The correlation, however, is not absolute; there are a number of species with the uncus entire but also without gnathic structures.

In conclusion we would note that Grey has made a considerable study of the female armature. His work is still incomplete and at present he does not wish to offer any definite statements on the subject, but his studies are producing a wealth of detail corroborating the validity of the characterisation of the genera we have listed in Argynnidi.

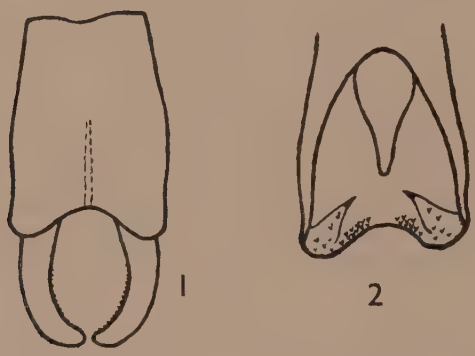
A NEW SPECIES OF THE GENUS *GRATIDIA* STÅL (PHASMOIDEA) FROM IRAN, WITH A LIST OF PALAEARCTIC SPECIES OF THE GENUS

By G. Bey-Bienko, D.Sc.

(*Leningrad.*)

About ten years ago I received from my good friend and colleague Dr. S. A. Predtetshensky a small collection of Orthopteroid insects made by him in Iran during his investigations of the biology and ecology of the Desert locust in 1930–31.

The collection contains one new Phasmid species which is described below.



Figs. 1–2.—*Gratidia predtetshenskyi* sp. n. ♂. 1, Anal tergite and cerci, seen from above; 2, anal tergite, seen from below (cerci removed).

Gratidia predtetshenskyi sp. n. (figs. 1–2).

N. Iran: Kazvin, F.IX, 1 ♂ (*Predtetshensky*).

Size relatively small for the genus, surface quite smooth, without puncturation. Head without any trace of a longitudinal median keel or paired tubercles, about twice as long as broad at the middle, narrowing posteriorly, basal width nearly equal to interspace between eyes; eyes hemispherical. Antennae covered with not very dense fine hairs, elongate, subequal in length to head, pronotum and mesonotum taken together, 23-jointed; 2nd joint very short, not longer than broad; 3rd joint about as long as the 1st; joints 4 to 12 slender, progressively more elongated, so that the 12th is equal in length to 3rd; 13th to 19th joints decreasing in length so that 19 equals one-half of 13; 19th to 22nd subequal in length and a little more than twice as long as broad.

Pronotum twice as long as broad at the middle, with three indistinct longitudinal furrows in anterior half and with very feeble transverse concavity at the middle. Meso- and metanotum with a very indistinct median longitudinal keel.

Abdomen without any trace of a longitudinal median keel. Anal tergite moderately elongate, slightly broadened posteriorly, with indistinct median keel in posterior half, hind margin with a relatively profound bow-shaped excision; lower surface of the tergite with small black denticles at the hind margin and with a relatively large black-tipped tooth on each side, produced from the latero-posterior angle of the tergite. Cerci moderately elongate, sub-equal in length to anal tergite, regularly incurved, slightly narrowing apically, inner side with very short and dense spiniform bristles. Operculum and other structures typical for the genus.

General coloration dirty pale-greyish, head with two narrow blackish postocular stripes.

Length of body 44; antenna 14; pronotum 2·1; mesonotum 8; metanotum 7·2; anterior femur (broken off); median femur 13; posterior femur 17·5 mm.

The type is unique.

This species belongs to the same group as *Gr. inconspicua* Brunner and *Gr. nana* Mistshenko, but differs clearly from both species in the structure of antennae, in the practically non-carinate thorax and in some other features.

The specific name is given to commemorate my friend and colleague, Dr. S. A. Predtetshensky, who has done some excellent work on the biology and systematics of Acridoidea and who prematurely lost his life in the bombardment of Leningrad in 1941.

The genus *Gratidia* Stål contains over 100 species, distributed chiefly in tropical Africa; 9 species penetrate into the Palaearctic region, and 6 species are known from the Indo-Malayan region.

A complete list of the species, described since Brunner and Redtenbacher's monograph of the Phasmoidea, was published by Ebner in 1933 (*Denkschr. Akad. Wiss. Wien* (mat.-nat.) **103** : 219).

As the distribution of the genus *Gratidia* in the Palaearctic region is of considerable zoogeographical interest, I think it useful to give the following list of the known Palaearctic species :—

1. *G. adelungi* Brunner, 1907.

   Eastern Turkmenistan (Transcaspia) and northern Afghanistan.

2. *G. bituberculata* Redtenbacher, 1889 (= *aliena* Brunner, 1907, see Mistshenko, 1937, *Proc. R. ent. Soc. Lond.* (B) **6** : 119).

   Soviet Middle Asia from the lower course of the river Ural and the Caspian Sea in the west to Eastern Tadzhikistan (Bokhara) and to Kuldzha, W. Chinese Dzhungaria, in the east.

3. *G. inconspicua* Brunner, 1907.

   Turkmenistan, Tadzhikistan and northern Iran; Mangyshlak peninsula; Balkhash.

4. *G. nana* Mistshenko, 1941 (*Mitt. Akad. Wiss. Georg. SSR, Tiflis*, **2** : 145).

   Valley of the river Araxes, S. Transcaucasia.

5. *G. predtetshenskyi* sp. n.

   Northern Iran.

6. *G. uvaroviana* Mistshenko, 1937 (*Proc. R. ent. Soc. Lond.* (B) **6** : 119).

   Turkmenistan and Khorasan province, N. Iran.

7. *G. spinulosa* Brunner, 1907.

Bampur in S.E. Iran.

8. *G. aegyptiaca* Gray, 1835 (= *bifida* Brunner, 1907; *G. fourniali* I. Bolivar, 1906; see Chopard, 1940, *Rev. franç. Ent.* **7** : 29).

Mauritania, Sahara, Egypt, Anglo-Egyptian Sudan, Somaliland.

9. *G. kurda* Uvarov, 1944 (*Ann. Mag. nat. Hist.* (11) **11** : 64).

Kurdistan.

The distribution of the Palaearctic members of the genus *Gratidia* shows that they belong to the Eremian fauna (Uvarov, 1921, *Proc. zool. Soc. Lond.* **1921** : 447) and there are no species with a true Mediterranean distribution.

The present knowledge of the ecology of Phasmoidea is very imperfect but it is evident that they live on trees and shrubs. Fragmentary observations made by me on *Gr. bituberculata* in Tadzhikistan in 1933 showed that that species lives on shrubs and undershrubs in irrigated parts of the semi-desert. Therefore the genus *Gratidia* must be included in the arbusticolous type of ecofauna (Uvarov, 1938, *Mém. Soc. Biogéogr., Paris*, **2** : 231).

The geographical distribution of the genus *Gratidia* suggests that it belongs to the ancient tropical fauna of the Ethiopian or even Lemurian stock (Uvarov, *loc. cit.*) which extended to northern Africa, Iran and Turan in Tertiary times. The subsequent desiccation of forests of tropical or subtropical type in this zone and their replacement by deserts, or semi-deserts with shrubs and undershrubs, led to the adaptation of the original mesophilous members of the genus to the more xerothermic conditions and dry scattered shrubby vegetation.

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41, Queen's Gate, S.W.7

1946.

WEDNESDAY, June 5
„ October 2, 16
„ November 6, 20
„ December 4

1947.

WEDNESDAY, January 15 (ANNUAL MEETING)
„ February 5

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